

Physico-Chemical nanomaterials science

Coupled gold nanoparticles by 1,9-nonadithiol: Correlation between light absorbance and morphology

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The formation of gold NPs assemblies can occur in ethanol-water suspension by relative concentration solvents, using various passivation agents or multivalent thiol ligands, employing dithiol organic molecules. However, since NPs are normally synthesized in water and most of the thiols are found to be soluble in ethanol, thus mixing of NPs with thiol-ethanol solution induced uncontrollable process self-assembly.

Herein, we obtained twinned NPs from citrate-stabilized gold nanoparticles (Fig.1) in a reproducible way by regulating of concentration of 1,9-nonadithiol/ethanol in water colloidal solution of citrate capped gold NPs. Examination of the optical properties of solutions and morphology cross-linked NPs precipitated on solid support allowed to develop an optimal pathway for gold NPs dimers formation.

The atomic-force and scanning electron microscopy allowed us to correlate the color of achieved colloidal solutions of the NPs modified with 1,9-nonadithiol and their optical response with the quantity of tailored twinned nanoparticles connected through bifunctional linker.

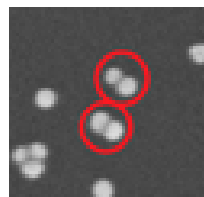


Figure 1. SEM image of gold NPs dimers